Strategy Research Project

ARCHITECTURAL ANALYSIS OF ENTERPRISE MANAGEMENT

BY

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USAWC CLASS OF 2011

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USAWC STRATEGY RESEARCH PROJECT

ARCHITECTURAL ANALYSIS OF ENTERPRISE MANAGEMENT

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The Department of the Army has one constant – change. Change has most notably occurred in Army operational force structure such as the recent conversion to the modular brigade combat teams. This pervasive reengineering included a new approach to provide capabilities for dynamic environments through the Army Force Generation Model. Paradoxically, the proclaimed success of this transformation has not translated into innovation of how the Army developed the "back-office" that manages and generates the combat forces. This paper extends the use of operational design using enterprise architecture to provide a refined approach for achieving adaptability for the Army.

ARCHITECTURAL ANALYSIS OF ENTERPRISE MANAGEMENT

After nearly a decade since the 9/11attacks on the United States, the nation has aggressively sought to employ all elements of national power to defend the country. Unlike the campaign that resulted in a quick and decisive military victory during Desert Storm, this Global War on Terrorism, with its on-going, operations in Afghanistan and Iraq, is a protracted strategic engagement that continues to test the sustainability of the United States in all aspects of national power.

As a result of these experiences, the U.S. Army has sought many lessons from this war – at the tactical, operational, and strategic levels. One of the most discussed strategic issues has been the relative merits of a counter-insurgency or a counter-terrorism strategy. The new field manual that codified the doctrine for counter-insurgency (FM 3-24) presents the fundamentals of operational design.

Additionally, the Army has changed is fundamental approach to generating combat capabilities using the Army Force Generating (ARFORGEN) model, which has led to the revision of its over-arching approaches presented in the Army Capstone Concept and Army Operating Concept. Together, these documents address how the Army blends its capabilities through the six war-fighting functions to support the joint force. The goal is to provide greater synergy in the Army's efforts to support the war fighters. Thus, the Army is required to develop concepts to drive change in the Army's doctrine, organization, training, material, leadership, personnel, and facilities.

While this doctrinal refinement provides a much-needed update informed by the assessment of the joint operating environment at the strategic level, it does not provide

explicit guidance for the operational level to seamlessly integrate war-fighting capabilities throughout the Department of the Army.

In a recent discussion, a former Combatant Commander and member of the DoD Science Board shared preliminary findings of a recent study -- the Army must adopt a portfolio management approach to address the challenges at the operational level in its institutional efforts. Current leaders are very aware of this challenge; they recently revived and adapted of the functional area reviews, designating them as the capability portfolio reviews. This approach enables the Army to review its weapon systems within a collection of current programs to identify synergies or redundancies. Senior Army officials claim that these efforts will facilitate institutional adaptation. But without a framework to guide analysis and assessment at this critical level of managing the Army's capabilities' relevance, flexibility, and adaptability, the Army will remain ineffective in critical areas.

This research paper will synthesize current, theory and practice in design from academia, industry and military domains. It offers comprehensive recommendations to fill this gap in enterprise management. It shows how these recommendations can be implemented by a means of a multifunctional, cross-Army Command enterprise. The design insights identified in this analysis are supported by underlying principle of enterprise management.

Reviewing the existing literature, Commanders employ design "to understand, visualize, and describe complex, ill-structured problems and develop approaches to solve them."[1] Design enables commanders to solve problems methodically by framing

the environment, by reframing the problem, and then formulating operational approaches. This methodological approach is founded in systems science.

The modern study of systems is principally based upon the work of von Bertalanffy.[2] As a biologist, he sought to blend the dominating approaches of reductionists and consilience.[3] His novel approach had a profound impact with the concept of near-decomposability. He thereby proposed that a system, which could be deconstructed into sub-systems or components, was greater than the sum of the sub-elements due to interactions among the components. Most military transformation efforts usually leverage the system engineering research based on research of systems of systems, network theory and complexity theory.[4] However, today's senior leaders remain largely unaware of the significant opportunities that design-approaches combining these concepts with fundamentals of contingency theory of organizations as systems.[5]

Relying on a general systems theory, researchers recognized this permeable organizational boundary. But they remained focused on sub-organizational interactions with such terms as "the firm" or "the corporation." This designation assumes explicit ownership and well-defined oversight which in systematic terms means "unitary control."[6] However, other researchers recognize the importance of understanding the relationships between organizational components in systems that may not have underlying ownership controls. From this work, researchers eventually identified stakeholders as the "building blocks" of socio-technical organizational systems.[7]

Management Archetypes

While there is a broad field of study of control theory in systems research, organizational researchers identify this work as management. Fredrick Taylor is usually credited as the founder of management science and the first management archetype.[8] His theories of socio-technical systems link workers to mechanistic processes by means of incentives. His working example of this transformative approach was the Ford assembly line. Using Taylor's theories, managers could integrate diverse tasks, both in serial and parallel configurations, to achieve continuous through-put. Alfred Sloan found by establishing a management hierarchy that replicated military staffs, he could provide effective business units with increased diversity of product families. Ford found itself competing against General Motors, which had multiple assembly lines to produce a range of related products that would satisfy the demands of a more sophisticated user-base.

This added dimension of hierarchy in business was not revolutionary to the military. Based on study of the extremely effective management structures of Roman legions and the German General Staff, Max Weber codified the "Bureaucracy."[9] He proposed that strict system analysis and engineering would produce an optimal organization. This second management archetype is the bureaucracy which exhibits the following characteristics:

> "1) There is the principle of fixed and official jurisdictional areas which are generally ordered by rules that is by laws or administrative regulation
>
> 2) The principles of office hierarchy in the levels of upgraded authority mean a firmly ordered system of super/insubordination in which there is a supervision of the lower offices by the higher one
>
> 3) The management of the modern office is based upon written documents which are preserved in their original or draft form

> 4) Office management at least all specialized office management-in such management is distinctly modern-usually presupposes thorough and expert training
>
> 5) When the office is fully developed official activity domains the full working capacity of the official, irrespective of the fact that his obligatory time in the bureau may be firmly delimited;
>
> 6) The management of the office follows general rules, which are more or less stable, more or less exhaustive, in which can be learned"[10]

It is typically at this point of theoretical development that the practitioner's familiarity of management archetypes is exhausted. Bureaucracy has become the scapegoat for the majority of the systemic flaws of large organizations which have institutionalized most of Weber's characteristics.[11] However, just as systems theory continued to mature and provide more insights, management betrayed the assumption of unitary control mechanisms, based on the concepts of cognitive limitations of human managers within a larger system (i.e., bounded rationality) with a theory of Administrative Behavior.[12] This emergent concept does not have widespread acceptance among systems engineers or force developers because it does not provide great insight to new organizational structures or change the "org-chart." However, administrative behavior gets to the heart of the challenges of most large hierarchical organizational socio-technical systems -- managers throughout the hierarchy (or chain-of-command for military) "satisfice" to make decisions or solve problems. The managers (or administrators) choose alternatives that are not globally-effective because they are unable to either account for a subset of situation factors or address a subset of decisions.[13] As a result, they entertain "limited resultant system behavior alternatives."[14]

Builders of organizational systems encounter many persistent questions: How do we ensure alignment of system objectives? What is the best organizational

structure? What is the desired output? How can we sustain relevance in a dynamic environment? While such questions are asked daily throughout the Army, the answers vary because of a number of considerations: current environment, status of other organizations, resources, information, and decision-time horizon. These variables determine the systemic impact of dynamic complexity.[15] Most importantly these variables are determined by the underlying structure of the system, its architecture, "which determines its form and function."[16]

An Army of Enterprises

The term "enterprise" is defined as an integrated entity which creates value for its multiple stakeholders.[17] Its value is determined by "how various stakeholders find particular worth, utility, benefit, or reward in exchange for their respective contributions to the enterprise."[18] The Army established the Office of Business Transformation to support the Secretary of the Army "with business transformation initiatives for the Army Enterprise."[19] While not explicitly defined, one can infer the term "Army Enterprise" as the Department of the Army ownership and responsibility for an integrated military service that should provide value for its stakeholders.

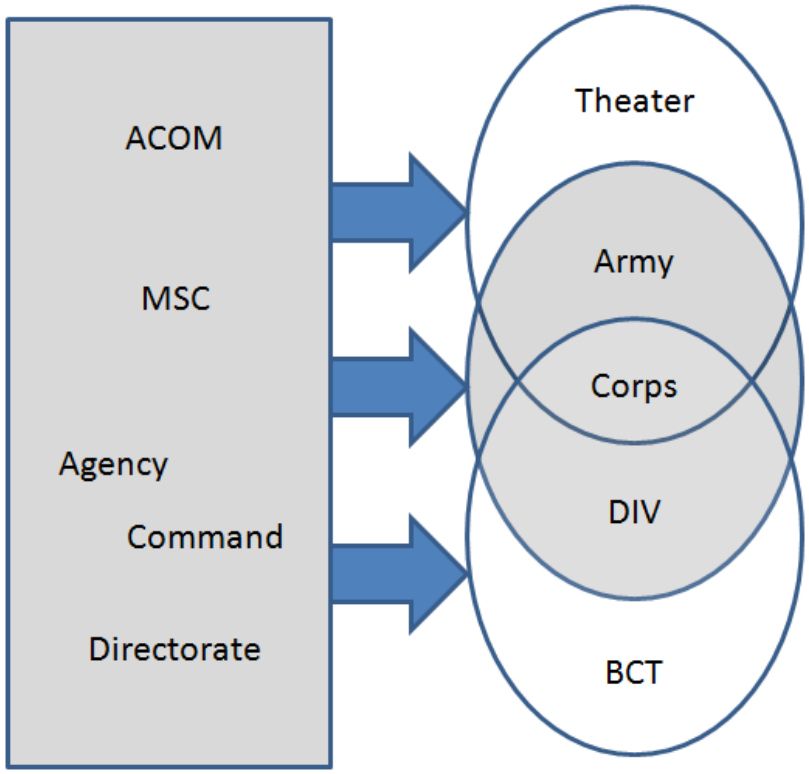

Figure 1. Comparison of Strategic Levels for Institutional/Operational Army

The military has developed a well defined taxonomy for its various combat forces, see Figure 1. (n.b. although during the initial efforts to transform the operational force as the Future Combat System had organizational levels above battalion called "units of action" and "units of employment." But, the traditional organizational terms were restored when the Army converted to modular units.) However, for functional units, other than training brigades, directorates or departments may have significant differences in size, resources, scope of work, etc. A universally accepted taxonomy of enterprises has not been established in the lexicon of the Army, industry, or academia.[20] As part of collaboration between DoD and the Massachusetts Institute of Technology, research has produced a generalized hierarchy of enterprises, beginning with program,

multi-program, and national level enterprises.[21] For clarity, the term “program enterprise” is does not apply to its use in the Planning, Programming, Budgeting, Execution process term “program.” Rather “program” refers to the level of responsibility assumed by a product manager or Military Decision Package (MDEP) Manager.

Enterprise Architecture Framework Views

After developing a stratification of enterprises, the next consideration is a framework that provides the necessary perspectives to convey the form and function of the enterprise system. While there are several ways to convey architecture,[22] there are also various frameworks that attempt to capture enterprise architectures.[23] The following Enterprise Architecting Framework Views are drawn from other literature reviews and previous Army research efforts.[24]

Strategy

The goals, vision and direction objectives of the enterprise with an emphasis on the business model and competitive environment.

External Factors and Policies

The external regulatory, political and societal environments in which the enterprise operates.

Process

The lifecycle, enabling and leadership processes by which the enterprise creates value for its stakeholders.

Organization

The organizational structure as well as the relationships, culture, behaviors, and boundaries between individuals, teams and organizations.

Knowledge

The collective implicit and tacit knowledge, capabilities, intellectual property collectively in the enterprise.

Infostructure/Infrastructure

The information needs of the enterprise including the flows of information as well as the systems and technologies needed to ensure information availability of information.

Product/Services

The product architectures and the service architecture of the enterprise, including services as a primary product or "in support of" products.

Interactions among the Enterprise Architecture Framework Views.

The views provide needed multiple perspectives necessary, but the architecture is incomplete without understanding the interactions among the views. The following table is an adaptation of the interactions:

	Strategy	Process	Org	Know	Info/Infra	Prod/Serv	Policy/Ext
Strategy		+	+	+	+	+	+
Process			+	+	+	+	
Organization				+		+	
Knowledge			+				
Info/Infra	+			+			
Prod/Serv	+	+	+	+	+		+
Policy/Ext	+					+	

Table 1: Enterprise View Interaction Matrix[25]

The table depicts the pair-wise influence relationships (e.g. Strategy directly influences Process, Organization, Knowledge, Infostructure/Infrastructure, Product/Service, and Policy/Environmental Factors.) While strategy is, hypothetically, the most influential is the most influential view on the others, enterprise strategy was found to have the least influence on stakeholder salience within the Army program.[26]

Stakeholders

The Stakeholder Salience Framework was originally developed to identify stakeholders and then categorize them according to attributes that correlate with their perceived salience.[27] These are the relevant attributes:

Power: the ability to bring about the desired outcomes.[28]

Legitimacy: the "generalized perception or assumption that the actions of an entity are desirable, proper and appropriate within some socially constructed system of norms, values, beliefs, and definitions."[29]

Urgency: the degree to which stakeholder claims call for immediate attention.[30]

Stakeholder theory in enterprise systems addresses the interactions and relationships among actors when there is a lack of ownership (or chain-of-command). The stakeholders' organizational roles are often confused with administrative behavior, which produce the organizational inertia that is often called "red tape." The resistance to accept change, activate a process, provide a service, or share information is based upon the perceived lack of the respective stakeholder salience.

The preceding literature review suggests ways to extend the Army's use of operational design to promote enterprise management.

Army Enterprise Design Case Study

The majority of the data for this research effort was collected as part of a study requested by the Commanding General, Aviation and Missile Command (AMCOM) in 2007-2008.[31] The study results facilitated identification of significant enterprise architecture framework views and the design perspectives that contribute to management archetypes that undergird enterprise behaviors.

Background

The flight school training at Fort Rucker (also known as Flight School XXI or FS XXI) is resourced with more than a billion dollars a year. FS XXI is a combined effort of primarily the U. S. Army Aviation Warfighting Center (USAAWC), a major subordinate command of Training and Doctrine Command; Aviation Center Logistics Command (ACLC), part of the Aviation and Missile Command, (AMCOM), a major subordinate

command of Army Material Command; and the garrison command of Fort Rucker, which reports through the installation management chain of command to the Installation Management Command. This would be classified as a multi-program enterprise according to the LAI enterprise taxonomy.

The training program persistently suffered from a "backlog" of students as they transitioned between courses. Further, a projected significant increase of student-load in 2012 was expected to exacerbate this systematic behavior. The research efforts were designed to ensure functions of maintenance and logistics were supporting FS XXI and to recommend alternatives that might improve functional or enterprise performance.

Strategy

Before developing strategies, the first questions posed as part of operational design prompted the command to develop a "contextual understanding of the situation by framing the operational environment."[32] This view is typically considered an outward-looking perspective that creates a significant "blind spot." Using a systems-thinking approach, the assessment must determine and consider relevant variables. In an open-systems approach, these variables are evaluated as:[33]

Endogenous - included as part of the system

Exogenous - interacting with the system but not influenced by the system

Excluded - not considered as part of the system

Institutional Army multi-program enterprises, assumed to be buffered by their relationship with the operational force, must challenge the classification of the variables that are considered to be excluded or exogenous. By considering the operational environment in a more complete context, approaches can be developed.

The four objectives of the ACLC as part of the multi-program enterprise:

1. Provide Aircraft mission-capable rate in excess of 70%
2. Increase intermediate level maintenance capacity for National Maintenance Plan
3. Increase Depot Level Maintenance Level Capacity
4. Implement Lean everywhere possible

In this broad context, it was evident that ACLC assessed the environment for their mission to support operations at USAAWC with a generally accepted readiness metric-level (i.e. 70% Mission Capable Rate). However, by improving their ability to execute operations through a Lean initiative, ACLC would be able to increase support the local aviation maintenance program and contribute to the broader U. S. Army Aviation Enterprise. This is an example of the effects of the interaction between strategy and process views. However, one of the challenges with systems analysis is while gains may be achieved in one perspective, there are often trade-offs in other areas.

Stakeholder Analysis

Tactical commanders analyze mission variables of troops, enemy and civilian considerations. But at the operational level, the list of variables expands to account for the interactions, relationships, and claims of all potentially relevant actors (i.e. candidate stakeholders.)[34] The Stakeholder Salience Framework reveals eight possible categories -- beginning with non-stakeholder, where a candidate stakeholder fails to be perceived as having sufficient levels of three attributes (power, legitimacy or urgency) of definitive stakeholders.

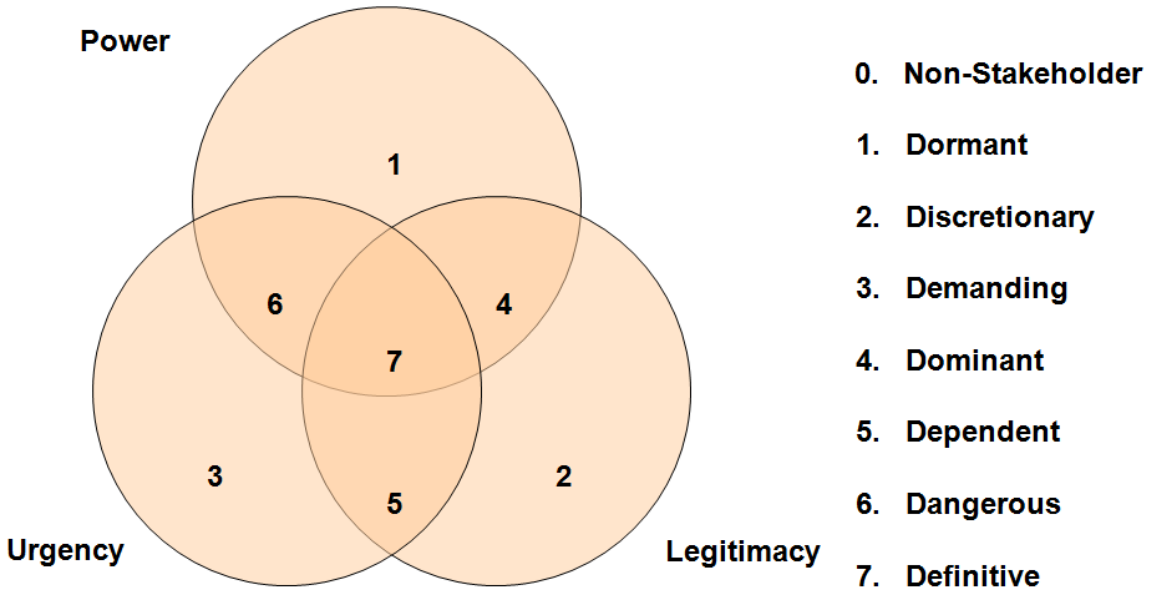

Figure 2. Stakeholder Salience Framework[35]

For those candidate stakeholders perceived as stakeholders, they influence the enterprise value creation process based upon their salience attributes.[36] Those who have perceived legitimacy strongly influence the identification of what is valued. Stakeholders perceived as having power influence the creation of the value proposition, which is the basis for the exchange of value. Those perceived as having urgency, influence the value delivery. This process now presents the Army Enterprise Design with a basis by which to consider alignment of stakeholders and to qualify their dynamic influence on the enterprise in recurring execution of the value creation process.

Consider its application to the FS XXI multi-program enterprise. USAAWC, the 110th (Aviation) brigade, and ACLC, were considered definitive stakeholders; its program manager was considered to have power and legitimacy, but not urgency. Accordingly, the program manager did not have as significant influence on the value delivery on FS XXI. Based on the analysis of the mission capable rates, ACLC has been successful at an average 73.3%, which satisfy the value proposition agreed to by

the USAAWC and AMCOM. Mission Capable is defined as the rate of aircraft that at the airfield ready for training missions in support of FS XXI. However, comparing the number of flight hours available for the fleet at Fort Rucker against the number of flight hours executed to the utilization rate, the fleet was 25% to 58% over-capacity. As a result, the program manager, universally recognized as having lifecycle management responsibility for the capability, was unable to deliver greater value to other definitive stakeholders in their extended enterprise architecture. Prior to this analysis, the problem was "invisible" and had not been captured in the framing effort. This demonstrates the significance of the stakeholder values and the strategic objectives – especially as objectives and related metrics are established.

Process, Infostructure/Infrastructure, Product/Service Interaction

One of the significant differences between the tactical military decision making process (MDMP) and operational design is the contrast between phased open-loop thinking and iterative closed-loop thinking. Phased open loop thinking of the MDMP moves the command toward a decision on the course of action used to execute the mission. However, to address the dynamic complexity at the operational level, closed loop thinking enables the command to develop an approach and requires it to reframe the context. The closed loop promotes effective learning and adaptation.[37]

One of the foundations of our understanding of how administrative behavior is manifested in organizations is based on the task environment, which forms the basis for long-linked technologies.[38] The task environment offers insight into the interaction of the process view and the infostructure/infrastructure. This synergy from the relationship of these two views dramatically influences the products and services that the enterprise can provide. The expansion in the scale of mission types that has come with the

recognition of full-spectrum operations, in addition, DOD's product orientation has expanded to acknowledge the domination of service-based value.

This new awareness is evident throughout the Department of Defense.[39] It has logically increased interactions among critical enterprise stakeholders. This "jointness" was initially a policy objective in the establishment of the Department of Defense and the subordination of the Secretaries of War and Navy to the Secretary of Defense.[40] It was solidified with passage of the Goldwater-Nichols Act Department of Defense Reorganization Act of 1986[41] which codified formally joint interactions in the DOD. As our military services continue parochial efforts to fulfill their Title 10 responsibilities, integration requirements will dramatically increase.[42] More explicitly, given the exponential increase on DOD's reliance on information technology, the infrastructure of the Pentagon has been dwarfed by the infostructure of the defense command and control and business systems.

While the Army has invested significantly in logistical enterprise resource planning systems[43] and human resource planning systems, it continues to develop network-centric approaches at the strategic level.[44] Indeed, the gap in operational level design for enterprise architectures was evident in FS XXI.

During site-visits to collect data, extensive efforts were made to develop an architectural representation of the views. Based on the product/service view of logistics and maintenance, it was apparent that the fleet management service required extensive high-levels of data quality to support dynamic and responsive decision support processes.[45] FS XXI's connections to the strategic level systems were readily apparent: replacement parts were nearly wholly visible in distant supply locations, each student's

projected report date was accessible and a recent history of maintenance on each aircraft demonstrated the vertical integration within each function of the "value chain."[46] But at the critical process interaction node, where aircraft missions were assigned, the research team learned that a contracted clerk at Rucker's airfield selected the aircraft for the requested missions. Surprisingly, the algorithm to optimize the multiple objectives that numerous stakeholders demanded from FS XXI was reduced to a simple sequential heuristic. Starting at the top of the spreadsheet, that contained the list of aircraft sorted by tail-number, the clerk would proceed down the list and select as many aircraft as necessary, skipping any that were not listed as mission-capable. This simple check-off process gave no consideration to such critical knowledge such as availability forecasts (e.g. time until scheduled maintenance), condition-based maintenance analysis, and future missions beyond that day's requests. It appeared to be a tactical issue to focus on the clerk doing his or her best to provide mission capable aircraft to meet the 70% standard, but the effects and consequences were operational. Previous research efforts on other types of supply-chain simulations with minimal complexity, dynamic systemic optimization methods improved the performance by a factor of 10.[47] There are significant opportunities in billion-dollar enterprises that are at least operational if not strategic in their impact.

Case Insights and Findings

Based on developing representations for the FS XXI enterprise architecture, there was some level of "analytical surprise." For example, the apparent completeness of each view considered independently obscured the tremendous gaps that become evident when the views were "over-laid" to consider the interactions. These enterprise architecture gaps have been documented, but only as propositions. To present the

significant findings, the following figures are used to encapsulate the approaches available in operating models.[48]

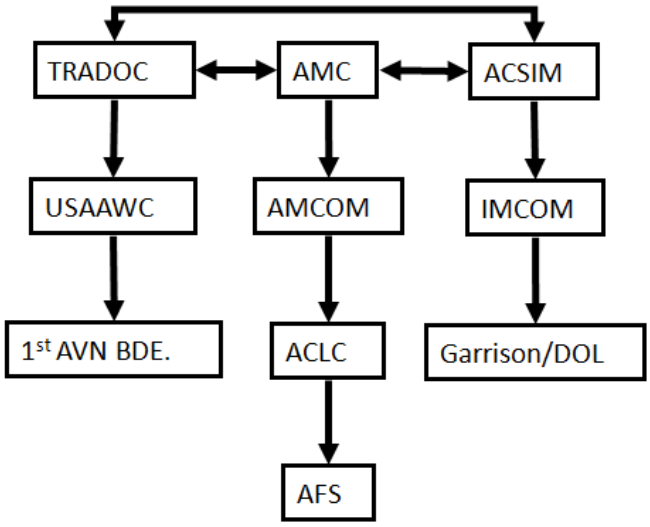

Figure 2. FS XXI Bureaucracy Operating Model

The first model depicts the current operating model for FS XXI. While Figure 2 may look like a simple organization chart, it accurately reflects the approaches offered by all of the Enterprise Architecture Framework Views. The strict hierarchy of the bureaucracy should dominate the system behavior and exhibit the four problems of bureaucracy:[49]

Accountability – All stakeholders can influence the value creation process. Reviewing the alignment of the stakeholder objectives and their alignment to the strategy of FS XXI's core value proposition of producing the number and type of trained and ready Army aviators, the team found contradictions to several stakeholders stated objectives that were aligned to their respective functional hierarchy. These stakeholders were not perceived as having sufficient level of power and were unable to influence the value proposition to change the value proposition to support their specific needs. The enterprise, therefore, did not exhibit the first problem of bureaucracy.

Equity – All candidate stakeholders' claims are met with similar treatment and level of interaction. Based on the stakeholder's level of urgency, there was a high degree of difference in the value delivery aspects of the value creation process. Thus with this prioritization, the second problem of bureaucracy was not evident.

Fiscal Integrity – The relationship between principal (manager) and agent (actor) is definitive and inflexible; any change must be accomplished through a complete re-negotiation of the "contract." The data collection and analysis for this involved both government-to-government agreements as well as government to contractor relationships. The government-to-contractor relationships contained clauses that permitted adaptation through adjustments of performance metrics and incentive structures, which prevented needed renegotiations during the contract term. Interestingly, the government-to-government relationship was perceived to be inflexible. For example, the projected student load by the Headquarters, Department of the Army through the Training and Doctrine Command Headquarters was only adjusted through a training and resource allocation process (TRAP). But this was not closely integrated into the resource management processes. As a result, there was insufficient clarity to discern whether the "contract rate" for students was changed. Based on the conclusive analysis, this was not identified as a problem.

Efficiency – This has a different connotation from Wilson's definition that efficiency is the bureaucracy's efforts to optimize benefits while it is significantly constrained. This problem has received widespread attention in literature and public statements. Based on strong demand down the value chain for Army Aviators, the FS XXI was given significant resource increases to expand the feasible domain. Despite

tactical-level initiatives to improve the process technologies through the use of Lean, there was not an operational-level effort to address the identified architectural gaps. This was not identified as a problem.

This analysis provides valuable insights into the utility of environmental framing. Rather than simply blaming bureaucracy, this process provides a systematic way to assess administrative behavior.[50] Using this theoretical basis and follow-on work, the data was analyzed and enfolded in the administrative behavior literature.[51] As a result, this operating model was developed by incorporating multiple enterprise architecture views as a composite figure.

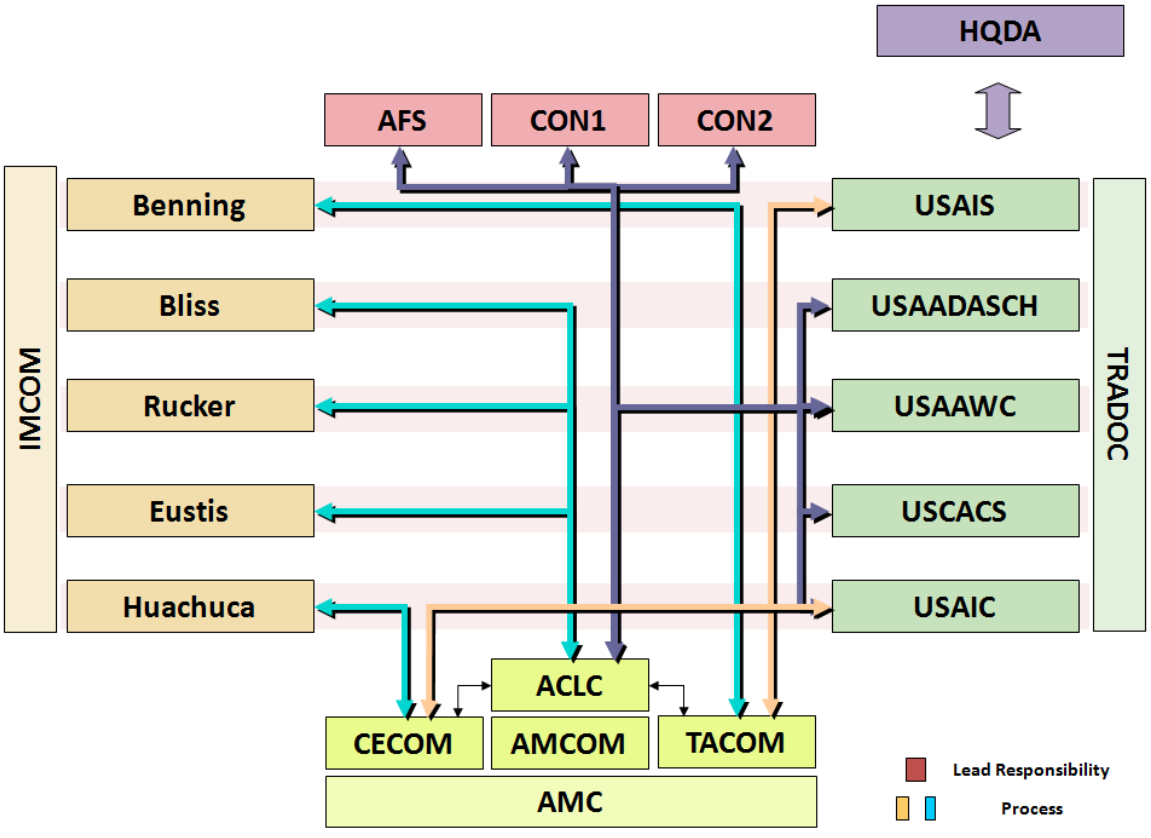

Figure 3. FS XXI Administrative Behavior Operating Model

This model reflects interactions that are evident in the localized interactions at Fort Rucker. But it also captures the interactions across a fleet that is managed as part of the aviation institutional training program by Training and Doctrine Command, which is then supported by ACLC and the fleet management program. Based on this perspective the following propositions are evaluated.

The first proposition of administrative behavior posits that "when support capacity is concentrated and balanced against concentrated demands, but the power achieved through contracting is inadequate, the organization involved will attempt to coalesce."[52] This proposition offers an explicit example of what the Army's use of the term "enterprise management" infers. It reveals that the definitive stakeholders of FS XXI work together with other organizations in the task environment to act as one to with respect to the achieving certain operational goals. This complies with one of the central proposals of the enterprise management initiative by establishing a "board of directors." However, it is posited that in the right conditions coalitions may form.

One of the mechanisms put in place to facilitate coordination and decision making was a coalition – affectionately called the "four-horsemen." This group consisted of the senior representative of USAAWC, AMCOM, PEO-Aviation, and USCACS. Qualitative data analysis of interview data, detailing the formation of the group, confirmed that power was widely distributed among the stakeholders. When the power of an individual in a highly-discretionary job is less than the individual's dependence on the group, the individual will seek a coalition. This aptly describes the environment of the FS XXI: Each of the senior officials was responsible for their respective function, but each belonged to a chain-of-command that required vertical

coordination to forcibly “change exchange contracts.” So the coalition provided a mechanism for the coalition to influence a senior official to effect change of his or her own volition.

The somewhat complex appearance of the model depicts several interactions among the views, but it also reveals the absence of even more potential interactions. So when these views are not fully mature, reframing and iterative learning is in necessary. This is an important aspect of design. By not continuing the iterations of the design process, the organization postured for the final proposition. Fully aware where cause-effect knowledge is incomplete, the organization then considers its bounded rationality. It is now prepared to seek national explanations for FS XXI’s under-utilization of the Fort Rucker fleet and for its failure to improve its method of selecting aircraft for training missions. Without clearly identified cause and effect relationships, the dynamics of the enterprise system remain ambiguous and only support inferences. Oblivious that the respective stakeholder measurement systems are not part of the feedback structures, the enterprise cannot provide rational explanations. Much like the comparator function of the management system offered by Ackoff, the closed loop method of design cannot be implemented without this effort.[53]

This analysis provides the ability to reframe the problem from one of accepting the “pitfalls” of bureaucracy to now systematically developing approaches for administrative behaviors that reinforce positive behaviors and balance those that may be detrimental. Several initiatives were developed and presented to the research sponsor as a “road-map,” however due to several changes in the enterprise leadership, the coalition requested to start over using their own resources.

Conclusions

Military organizations have historically been the laboratories of management innovation. From ancient times to current operations, military leaders have formed, trained, and led armies by means of organizational designs that are far more complex than those of their business and industrial counterparts. The Constitution established the President as the Commander-in-Chief, and the Congress was empowered "to raise and support Armies"[54] with its appropriation of money. What the Constitution does not govern are the administrative systems that would be necessary to provide the national resources provided to meet the needs of the nation's defense. Title 10 USC does outline the military's leadership responsibilities for developing and managing the force.

These administrative systems must be flexible and scalable so they can respond effectively to changes in the demands of the system. They must be adaptable to function in dynamic environments. They must be resilient to understand uncertainty and unforeseen risks. Based on the research findings, aspects of operational design have effectively provided a framework for developing and refining enterprise architectures at the multi-program level. In case study findings, operational design methods have been integrated with other engineering systems approaches to develop enterprise architecture framework views that facilitated reframing the environment. Decision-makers can reframe the problem to identify the correct management archetype of administrative behavior to facilitate eventual consideration of alternative operational approaches.

This process fills a gap in Army doctrine; it provides guidance for the implementation of the enterprise management efforts. The architectural level of organizational systems provides sufficient understanding to address the persistent

issues that senior leaders have sought to address. This approach leverages the synergy of the strongest principles of organizational theory, the most advanced systems engineering concepts, and the practicality of leading management theories. Future work should continue to develop this into Army doctrine that supports the generating force of the Army. This would directly support the initial effort of the Army Capstone Concept to integrate Title 10 functions with the land war-fighting (operating force) capabilities.

Endnotes

[1] Department of the Army. *FM 5-0: The Operations Process*, (Washington, D.C., Department of the Army, 2010)

[2] Ludwig von Bertalanffy, *General System Theory: Foundations, Development, Applications* (George Braziller 1976)

[3] E. O. Wilson, *Consilience: the Unity of Knowledge*. (New York, Knopf: Distributed by Random House. 1998)

[4] D. S. Alberts, et al. *Network Centric Warfare: Developing and Leveraging Information Superiority*, (CCRP, Washington, D.C.1999); J. Moffat, *Complexity Theory and Network Centric Warfare* (CCRP, District of Columbia, 2003)

[5] F. E. Kast and J. E. Rosenzweig *Contingency Views of Organization and Management* (Chicago, Science Research Associates, 1973)

[6] M. C. Jackson, *Systems Methodology for the Management Sciences*, (New York, Plenum Press, 1991)

[7] R. L. Ackoff, *Creating the Corporate Future: Plan or Be Planned For*. (New York, Wiley, 1981).

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[9] M. Weber, et al,. *The Theory of Social and Economic Organization* (New York, Oxford University Press. 1947).

[10] These characteristics are used to define a bureaucracy. This is a significant distinction from the multitude of connotations attributed to the term. M. Weber, *Characteristics of Bureaucracy* (London, Oxford University Press. 1946)

[11] R. Gates, Eisenhower Library (Defense Spending) Remarks as Delivered by Secretary of Defense Robert M. Gates, Abilene, KS, Saturday, May 08, 2010, http://www.defense.gov/speeches/speech.aspx?speechid=1467

[12] Bounded rationality is defined as decision making with a proper subset of necessary variables that would be necessary to have appropriate situational awareness. When using these decision variable is would be rational but may not be rationale if more complete information was used for the cognitive process. H. A. Simon, *Administrative Behavior: A Study of Decision-making Processes in Administrative Organizations* (New York, Free Press 1997)

[13] While term “satisfice” is the use of a decision heuristic that produces an acceptable result, while a more rigorous and complex algorithm with a richer decision context would produce an optimal decision. Ibid.

[14] While most decision analysis in military context focus in fusing vast arrays of variables, this work demonstrates the significant impact of delays (high-order effects) on system behaviors and decision impacts. J. Sterman and E.-W. Diehl, “Effects of Feedback Complexity on Dynamic Decision Making. (Cambridge, Mass., Alfred P. Sloan School of Management, Massachusetts Institute of Technology. 1993)

[15] J. Sterman, *Business Dynamics: Systems Thinking and Modeling for a Complex World* (Boston, Irwin/McGraw-Hill. 2000): 22

[16] E. Rechtin, *Systems Architecting of Organizations: Why Eagles Can't Swim* (Boca Raton, CRC Press 2000)

[17] The Lean Aerospace Initiative is a research consortium initiated by the US Air Force with the Massachusetts Institute of Technology and numerous commercial partners to research solutions for defense acquisition challenges. Based on the research findings curricula is developed and taught among affiliated engineering schools world-wide. E. M. Murman, T. Allen, et al. *Lean Enterprise Value: Insights from MIT's Lean Aerospace Initiative*. (New York, Palgrave. 2002): 144

[18] Ibid., 178.

[19] J. McHugh, General Order No. 2010-01. Department of the Army. Washington, D.C.. (5 FEB 2010).

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[29] M. C. Suchman (1995). "Managing Legitimacy: Strategic and Institutional Approaches” The Academy of Management Review, 20(3), 571-610. Pg 574

[30] Mitchell, "Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts." 864.

[31] D.M. Matty, et al, “ACLC Support for FS XXI: Integrating the Enterprise”, (MIT, Cambridge, 2007); D. M. Matty, et al, "Army Fleet Management Enterprise." (MIT, Cambridge 2008).

[32] Department of the Army. *FM 5-0: The Operations Process*, 3-9

[33] Sterman, *Business Dynamics: Systems Thinking and Modeling for a Complex World* 95

[34] S. Banach and A. Ryan, “The Art of Design: A Design Methodology”, *Military Review*; (Mar/Apr 2009): 89

[35] For brevity, the full discussion of the implications of the eight categories of stakeholder salience is not presented but is worthwhile to fully employ this framework. Additionally, the work draws distinction between real and perceived salience and the consideration of latency of attributes in that a stakeholder may have the attribute but does not exercise or reveal the extent of the attribute consistently. Mitchell, "Toward a Theory of Stakeholder Identification and Salience: Defining the Principle of Who and What Really Counts." 874

[36] Matty, “Stakeholder Salience Influence on Bureaucratic Program Enterprise Value Creation”

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[38] J. D. Thompson, *Organizations in Action: Social Science Bases of Administrative Theory*. (New York, McGraw-Hill, 1967)

[39] R. Gates, Eisenhower Library (Defense Spending) Remarks as Delivered by Secretary of Defense Robert M. Gates, Abilene, KS, Saturday, May 08, 2010, http://www.defense.gov/speeches/speech.aspx?speechid=1467

[40] The National Security Act of 1947 (Pub. L. No. 235, 80 Cong., 61 Stat. 496, 50 U.S.C. ch.15

[41] The Goldwater-Nichols Department of Defense Reorganization Act of 1986 Public Law 99-433

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[50] Simon, *Administrative Behavior: A Study of Decision-making Processes in Administrative Organizations*

[51] J.D. Thompson, *Organizations in Action: Social Science Bases of Administrative Theory*

[52] Ibid, 36.

[53] R. L. Ackoff, *Creating the Corporate Future: Plan or Be Planned For*

[54] "The Constitution of the United States," Article 1, Section 8, Clause 12.